NATIONAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

PASTURE AND HAYLAND PLANTING

(Ac.)

CODE 512

DEFINITION

Establishing native or introduced forage species.

PURPOSE

- Establish adapted and compatible species, varieties, or cultivars for forage production
- Improve or maintain livestock nutrition and/or health
- Balance forage supply and demand during periods of low forage production.
- Reduce soil erosion and improve water quality
- Increase carbon sequestration

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied on lands where forage production and/or conservation is needed and feasible.

CRITERIA

General Criteria Applicable to All Purposes

Plant species and cultivars shall be selected based upon:

- Climatic conditions, such as annual rainfall, seasonal rainfall patterns, growing season length, humidity levels, temperature extremes, and the USDA Plant Hardiness Zones.
- Soil condition and position attributes such as pH, available water holding capacity, aspect, slope, drainage class, fertility level, salinity, depth, flooding and ponding, and levels of toxic elements that may be present.
- Resistance to disease and insects common to the site or location.

Seeding rates will be calculated by using the pure live seed (PLS) calculations, percent germination or by consulting the Pennsylvania State University Agronomy Guide.

Plant to proper depth ensuring seed or planting material will contact soil moisture uniformly. Prepare site to provide a medium that does not restrict plant emergence.

Planting dates shall be scheduled during periods when soil moisture and temperatures are adequate for germination and establishment.

All seed and planting materials shall meet state quality standards.

Select plants that according to federal, state, or local regulations are not considered noxious or invasive species.

Fertilizer and soil amendment recommendations shall be based on results from a current soil test. Application shall be appropriately placed and timed to be effective.

If needed, legume seed shall be inoculated with the proper species of viable Rhizobia before planting.

If using coated seed, recalibrate the planting equipment to deliver the same number of seed per area as would be applied with non-coated seed.

When establishing forage for pasture, livestock shall be excluded until the plants are well established.

Additional Criteria for Establishing Adapted and Compatible Species, Varieties, or Cultivars for Forage Production

Select forage species based on the intended use, realistic expected yield, maturity stage, compatibility with other species and level of management the producer is willing to provide. Plant adaptation to the proposed planting area shall be verified prior to planting.

Additional Criteria for Improving or Maintaining Livestock Nutrition and/or Health

Establish forage species that are most capable of meeting the desired level of nutrition (quantity and quality) for the kind and class of the livestock to be fed.

Additional Criteria for Balancing the Forage Supply and Demand during Low Forage Production Periods

Select plants that will produce forage for use during periods when other on-farm/ranch forage does not meet livestock needs. Forage species shall balance or help balance the dry matter demand of the animals for the desired period of time.

Additional Criteria for Reducing Erosion and Improving Water Quality

Plants shall provide adequate ground cover, canopy cover, root mass, and vegetative retardance to protect soil against water erosion.

Additional Criteria to Increase Carbon Sequestration

For optimal carbon storage, select species that increase site biomass.

Additional Criteria for Considerations in Selecting Forage Species to be Established

Properly match the selected forage species to the grazing habit of the livestock and management of the grazing system.

CONSIDERATIONS

In areas frequented by a high density of animals, establish persistent species that can tolerate close grazing and trampling.

Where wildlife is an objective, use the Pennsylvania Wildlife Habitat Evaluation Worksheet for Pasture and Permanent Hayland to aid in selecting plant species and providing for other habitat requirements.

Where air quality concerns exist, site preparation techniques should be utilized that will minimize airborne particulate matter generation and transport.

PLANS AND SPECIFICATIONS

Specifications for the establishment of pasture and hayland planting shall be prepared for each site or management unit according to the Criteria and Considerations described in this standard and shall be recorded on job sheets.

Site Preparation

In fields or areas that require it, install water-control structures, diversions, or grassed waterways prior to seeding

Establish or reestablish pasture and hayland plantings on the contour or in contour strips to control erosion.

Soil Fertility Requirement

Apply lime and fertilizer according to a current soil test (3 years old or less) or at rates recommended by a current Penn State University Agronomy Guide to establishment or maintain a seeding. Soil pH is the most limiting factor in the establishment of forages. For optimum germination and growth as well as fertilizer utilization by growing plants, soil pH should be maintained at the proper levels.

Soil pH (grasses) 6.0-6.5
Soil pH (legumes) 6.5-7.0

Lime and/or fertilizer should be applied prior to planting. For pH levels below 6.0 and no-till seedings, lime should be applied at least 6 months prior to the seeding date. If tillage is utilized, apply lime and fertilizer prior to the tillage operation. This allows some of the neutralizing material to move into the rooting zone prior to seeding. Lime applications of 4 tons per acre or more should be split into 2 applications to prevent burning of germinating plant material.

Seedbed Preparation

Conventional Tillage: A clean tilled seedbed may be used to establish pasture or hay seedings. Preparation of a clean seedbed can be accomplished by utilizing primary and/or secondary tillage implements. Rolling or cultipacking will be needed to firm up the seedbed prior to seeding. Footprints should not be deeper than ½ inch when seedbed is properly firmed.

Conservation Tillage: Disking or other tillage implements can be used to disturb the soil surface and incorporate prior crop residues. Firm the seedbed by rolling or cultipacking prior to seeding. Footprints should not be deeper than ½ inch when seedbed is properly firmed.

No-Till: When using a no-till method of planting to establish or renovate pastures and hay seedings, actively growing plant material should be controlled by mowing, herbicides, or grazing. Plant residue should be controlled prior to establishment to reduce competition and shading from actively growing plants.

Overseeding: For pastures or hayseedings that need to be renovated and do not require tillage, graze or mow existing vegetation down to a stubble height of 1 inch. Aggressively drag the area with a chain harrow or other suitable means to disturb the soil surface. After broadcasting seed, lightly drag the area to establish seed to soil contact.

Frost Seeding: For pastures or hay seedings to increase plant population, graze or mow the existing vegetation to a stubble height of 1 inch. Broadcast seed on the surface during the late winter when soils are freezing and thawing on a daily basis. This freezing and thawing action will incorporate the seed for early spring germination.

Seeding Rates and Dates

Seed shall meet or exceed the requirements of the Pennsylvania Seed Act for germination, purity, and noxious weed seed limitations.

When establishing pasture or hay seedings, use seeding rates recommended by a current version of the Penn State University Agronomy Guide or NRCS Agronomists, Grazing and/or Grassland Specialists.

When using a nurse or companion crop, the small grain seeding rate should not exceed 1 bushel per acre.

Pasture and hay plantings optimum seeding windows are as follows:

Spring Seeding:
Northern Pennsylvania- April 1 – May 15
Southern Pennsylvania- March 15 – April 15

Fall Seeding:
Pennsylvania- August 15 – September 15

Frost seeding of clovers and selected grasses should be performed in late February to early March when the freezing and thawing action heaves the soil surface.

OPERATION AND MAINTENANCE

The following Pennsylvania Conservation Practice Standards for management practices need to be successfully implemented into a conservation plan for the operation and maintenance of the Pasture/Hayland planting.

Forage Harvest Management (Code 511) for mechanical harvest of hay and maintenance of forage stand.

Prescribed Grazing (Code 528) for harvest of pasture forages and maintenance of forage stand by livestock harvesting.

The operator will inspect and calibrate equipment prior to use to insure proper rate, distribution, and depth of planting material.

The operator shall follow current soil test analyses on fields slated for establishment and maintain proper soil pH prior to establishment.

Timing of seeding is critical for the successful establishment of forages. All forages shall be seeded during the proper seeding windows. Mid-summer plantings are not recommended.

Growth of seedlings or sprigs shall be monitored for water stress. Depending on the severity of the drought, water stress may require reducing weeds, early harvest of any companion crops,

irrigating when possible, or replanting failed stands.

Invasion by undesirable plants shall be controlled by cutting, using a selective herbicide, or by grazing management that manipulates livestock type, stocking rates, density, and duration of stay.

Insects and diseases shall be controlled when an infestation threatens stand survival. Refer to the Pest Management Standard (595).

Evaluate forage stands each season or as needed to determine management inputs needed to achieve the desired purpose(s).

References:

Penn State Agronomy Guide (current edition) Pennsylvania State University, University Park, Pa.

Penn State College of Agriculture Agronomy Forage Fact Sheets (fact sheets available for each forage species)